

Appendix I
Toxicity Test Report

Prepared for:
CH2M HILL
3011 SW Williston Road
Gainesville, FL 32614

Prepared by:
Hydrosphere Research

Test performed at:
1901 NW 67th Place, Suite D
Gainesville, Florida 32653

Contact information:
Craig Watts, Lab Director
Tel: (352) 375-9004
Fax: (352) 375-0604

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Test Number:
CH2-EV 01006

Toxicity Test Report

Test Types: 7-day Chronic Static Renewal
Screen Toxicity Test (*C. leedsi* &
C. dubia), 14-Day Algal Growth
Potential Screen (*S.*
capricornutum), & 96-hour
Chronic Static Non-renewal
Screen Test (*S. capricornutum*)

Initiated: December 14, 15 & 19, 2000

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1 INTRODUCTION

CH2M Hill personnel collected grab samples on December 13, 15, 18, 2000. Hydrosphere Research received the first of these samples on December 14, 2000 in good condition. Using these samples, Hydrosphere Research initiated the following tests:

- 7-day Chronic Static Renewal Screen Toxicity Test (*Cyprinella leedsi*)
- 7-day Chronic Static Renewal Screen Toxicity Test (*Ceriodaphnia dubia*)
- 14-day Algal Growth Potential Screen (*Selenastrum capricornutum*)
- 96-hour Chronic Static Non-renewal Screen Toxicity Test (*S. capricornutum*).

2 METHODS AND MATERIALS

2.1 Methods

All testing was conducted according to either United States Environmental Protection Agency (USEPA) methods or Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOP). The following lists the methods or SOP's used:

1. U.S. Environmental Protection Agency. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms. Third Edition. EPA/600/4-91/002. Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. 341 pages. July 1994.
 - Fathead Minnow, *Pimephales promelas*, Larval Survival and Growth Test Method 1000.0.
In this report the test is referred to as a 7-day chronic toxicity test.
 - Daphnid, *Ceriodaphnia dubia*, Survival and Reproduction Test Method 1002.0.
In this report the test is referred to as a 7-day chronic toxicity test.
 - Green Alga, *Selenastrum capricornutum*, Growth Test Method 1003.0.
In this report the test is referred to as the 96-hour chronic toxicity test.
2. Florida Department of Environmental Protection, Biology Section, Standard Operating Procedures.
 - 14-day Algal Growth Potential (AGP) Test SOP #TA-8.2 v.3-9/19/97
3. U.S. Environmental Protection Agency. The *Selenastrum capricornutum* Printz Algal Assay Bottle Test. EPA/600/9-78/018. Environmental Research Laboratory, Corvallis, Oregon. July 1978.

Note that the Fathead Minnow, *P. promelas*, was not used in Method 1000.0 listed above. Instead, at the client's request, the Bannerfin Shiner, *C. leedsi* was substituted.

2.2 Test Organisms

Hydrosphere Research cultured the *S. capricornutum* in-house. The laboratory cultures were 4 days old and appeared to be in log phase growth. The 96-hour chronic toxicity test was stocked at approximately 10,000 cells per milliliter. The 14-day AGP test was stocked at approximately 1,000 cells per milliliter.

Hydrosphere Research cultured the *C. dubia* in-house. The daphnids were less than 24 hours old at test initiation and isolated within an 8-hour window of time.

Hydrosphere Research cultured the *C. leedsi* in-house. These organisms were less than 48 hours of age at test initiation. As noted elsewhere in this report, the *C. leedsi* were used in place of *P. promelas*.

2.3 Acclimation and Control Waters

The control water for the 96-hour chronic toxicity test was PAAP (Preliminary Algal Assay Procedure) media stock solutions (FDEP SOP #TA-9.9) added to Milli-Q® water. The EDTA PAAP stock was not added. For the 14-day AGP test PAAP medium (FDEP SOP #TA-3.3) was used for the control. The control water for the *C. leedsi* test was moderately hard reconstituted freshwater. The control water for the *C. dubia* test was aged moderately hard reconstituted freshwater.

2.4 Test Concentrations

All test performed were screens consisting of the control and 100 percent sample. All *S. capricornutum* tests consist of three replicates per sample. The *C. leedsi* test consists of four replicates per sample and the *C. dubia* test ten replicates per sample.

2.5 Sample Collection

The samples were collected by the client, packed with ice, and delivered via FedEx to Hydrosphere Research's Gainesville aquatic toxicology laboratory.

2.6 Sample Receipt and Preparation

Samples were received on December 13, 15, & 18, 2000. The client labeled the first set of samples Cell 2, 3, 4, 6 & 7 and the second and third set of samples Cell 2, 3, 4, 5 & 6. The bottles were labeled Cell 2, 3, 4, 6 & 7. A conversation with the individual that pulled the samples confirmed that the proper client labeling is Cell 2, 3, 4, 6 & 7. These samples were assigned the laboratory numbers 01006A-O. The samples were logged in upon receipt. Sample arrival temperatures are provided on the Chain of Custody forms in Appendix C and were recorded between 0.5 and 12.0°C. Sample volumes not needed for testing were stored at less than 4°C in the laboratory's cold room.

Samples needed for testing were warmed to room temperature prior to water quality measurements. Warmed samples were checked for acceptable water quality before organism exposures. Samples were placed in the testing bath prior to use in tests to equilibrate temperature.

The samples to be tested with *S. capricornutum* were filtered through 1.0 micron GF/b and 0.45 micron Gelman GN-6 Metrcel® filters. Nutrients were added to the 96-hour chronic toxicity test in the form of PAAP media stock solutions. The EDTA PAAP stock was not added. No nutrients were added to the samples used in the AGP test.

2.7 Test Conditions and Monitoring of Toxicity Tests

2.7.1 14-day AGP Tests with *S. capricornutum*

The tests began with the inoculation of test vessels with *S. capricornutum*. Test vessels were stoppered and placed in temperature controlled water baths. Test vessels were swirled by hand twice daily. Temperature was monitored daily. No other water quality parameters were measured. On the last day of the test, samples were filtered through Gelman GN-4 Metrcels® to determine gravimetric dry weights. Detailed test conditions are summarized in Table 2.7.1-1.

1. Test type	Static
2. Temperature	24°C ± 1°C
3. Light quality	"Cool White" fluorescent lighting
4. Light intensity	86 ± 8.6 uE/m ² /s (400 ± 40 ft-c)
5. Photoperiod	Continuous illumination
6. Test chamber size	250 mL flask
7. Test solution volume	60 mL
8. Renewal of test solutions	None
9. Age of test organisms	preferably, 4 to 7 days, or in log-phase growth
10. Initial cell density in test chambers	1,000 cells/mL
11. No. replicate chambers per concentration	3
12. Shaking rate	100 cpm continuous or twice daily by hand
13. Control water	Algal stock culture medium (i.e., PAAP)
14. Sample concentration	100% Sample
15. Dilution factor	None
16. Test duration	14 Days
17. Endpoint	Maximum Standing Crop (gravimetric dry weight)
18. Sample volume required	1 Liter (one sample for test initiation)

Table 2.7.1-1. Summary of Test Conditions for the 14-day Algal Growth Potential Test with *S. capricornutum*.

2.7.2 96-hour Chronic Toxicity Tests with *S. capricornutum*

The tests began with the inoculation of test vessels with *S. capricornutum*. Test vessels were stoppered and placed in temperature controlled water baths. Test vessels were swirled by hand twice daily. Temperature was monitored daily. No other water quality parameters were measured. On the last day of the test, aliquots of the sample were transferred to a Baxter Scientific Products SPotlite® Hemacytometer. The cell counts (cells per milliliter) were determined by counting four 1mm² sections on the Hemacytometer. Test conditions for the 96-hour Chronic Toxicity Test are summarized in Table 2.7.2-1.

1. Test type	Static
2. Temperature	25°C ± 2°C
3. Light quality	"Cool White" fluorescent lighting
4. Light intensity	86 ± 8.6 uE/m ² /s (400 ± 40 ft-c)
5. Photoperiod	Continuous illumination
6. Test chamber size	125 mL or 250 mL; standard is 250 mL flask
7. Test solution volume	50 mL or 100 mL; standard is 100 mL
8. Renewal of test solutions	None
9. Age of test organisms	4 to 7 days
10. Initial cell density in test chambers	10,000 cells/mL
11. No. replicate chambers per concentration	3
12. Shaking rate	100 cpm continuous or twice daily by hand
13. Dilution water	Algal stock culture medium without EDTA or enriched surface water
14. Effluent concentrations	Minimum of 5 and a control
15. Dilution factor ^a	Approximately 0.3 or 0.5
16. Test duration	96 hours
17. Endpoint	Growth (cell counts, chlorophyll fluorescence, absorbance, biomass); standard is cell counts
18. Test acceptability	2 x 10 ⁵ cells/mL in the controls; variability of controls should not exceed 20%
19. Sample volume required	1 Liter (one sample for test initiation)

^a Surface water samples for toxicity tests are used undiluted.

Table 2.7.2-2. Summary of Test Conditions for the 96-hour Chronic Toxicity Test with *S. capricornutum*.

2.7.3 7-day Chronic Toxicity Tests with *C. leedsi*

The tests began with the addition of *C. leedsi* to the test vessels. The test organisms were fed *Artemia* nauplii two to three times daily for the duration of the test. The test solutions were replenished daily with samples either from the cold room or those which were newly received. In both cases samples were warmed to test conditions prior to use. Survival, temperature, pH, dissolved oxygen and conductivity were monitored daily. At test termination surviving *C. leedsi* were rinsed in deionized water and transferred to tared aluminum weigh pans. These were dried over night in a drying oven at 70°C. Final weights were determined and averages were recorded on an original number basis (Section 9.5.3.1, Page 51 of Method #1 in section 2.1 above). Test conditions for the 7-day Chronic Toxicity Test with *C. leedsi* are summarized in Table 2.8.3-1.

1. Test type	Static renewal
2. Temperature	25°C ± 2°C
3. Light quality	Ambient laboratory illumination
4. Light intensity	10-20 uE/m ² /s or 50-100 ft-c (ambient laboratory levels)
5. Photoperiod	16 hours light, 8 hours darkness.
6. Test chamber size	1 Liter
7. Test solution volume	250 mL/replicate
8. Renewal of test concentrations	Daily
9. Age of test organisms	Newly hatched larvae less than 48 hours old
10. No. of organisms per test chamber	15 (minimum of 10); standard is 10
11. No. of replicate chambers per concentration	4 (minimum of 3); standard is 4
12. No. of organisms per concentration	60 (minimum of 30); standard is 40
13. Feeding regime	Feed 0.05 mL (about 1 drop) newly hatched (less than 24-hour old) brine shrimp nauplii three times daily at 4-hour intervals or, as a minimum, 0.15 mL twice daily, 6 hours between feedings (at the beginning of the work day prior to renewal and at the end of the work day following renewal). Sufficient nauplii are added to provide an excess. Larvae are not fed during the final 12 hours of the test.
14. Cleaning	Siphon daily, immediately before test solution renewal
15. Aeration	None, unless DO concentration falls below 40% saturation. Rate should not exceed 100 bubbles/minute
16. Dilution water	Moderately hard synthetic water is prepared using Millipore Milli-Q® or equivalent deionized water and reagent grade chemicals or 20% DMW (see Section 7)
17. Effluent concentrations	Minimum of 5 and a control
18. Dilution factor ^a	Approximately 0.3 or 0.5
19. Test duration	7 days
20. Endpoints	Survival and growth (weight)
21. Test acceptability	80% or greater survival in controls; Test acceptability for average dry weight of surviving controls has not been established for <i>C. leedsi</i> . 0.25mg/individual is the criteria for <i>P. promelas</i>
22. Sample volume required	4.5 Liter/day

^a Surface water test samples are used as collected (undiluted).

Table 2.7.3-1. Summary of Test Conditions for the 7-day Chronic Toxicity Test with *C. leedsi*.

2.7.4 7-day Chronic Toxicity Tests with *C. dubia*

The tests began with the addition of *C. dubia* to the test vessels. The test solutions were replenished daily with samples either from the cold room or those which were newly received. In both cases samples were warmed to test conditions prior to use. *C. dubia* food was added to the new test solution prior to test solution renewals. Adult survival, number of young present, temperature, pH, dissolved oxygen and conductivity were monitored daily. The test was terminated on day 7 when the controls had successfully produced their third broods of neonates. Test conditions for the 7-day Chronic Toxicity Test with *C. dubia* are summarized in Table 2.7.4-1.

1. Test type	Static renewal
2. Temperature	25°C ± 2°C
3. Light quality	Ambient laboratory illumination
4. Light intensity	10-20 uE/m ² /s or 50-100 ft-c (ambient laboratory levels)
5. Photoperiod	16 hours light, 8 hours darkness.
6. Test chamber size	30 mL
7. Test solution volume	20 mL
8. Renewal of test solutions	Daily
9. Age of test organisms	Less than 24 hours; and all released within an 8-hour period
10. No. of organisms per test chamber	1
11. No. of chambers per concentration	10
12. No. of organisms per test concentration	10
13. Feeding regime	Feed 6.67 µL each of YCT and algal suspension per 100 mL of test solution
14. Aeration	None
15. Dilution water	Moderately hard (MHR) synthetic water is prepared using Millipore Milli-Q® or equivalent deionized water and reagent grade chemicals or 20% DMW; standard is MHR
16. Effluent concentrations	Minimum of 5 effluent concentrations and a control
17. Dilution factor ^a	Approximately 0.3 or 0.5
18. Test duration	Until 60% of control females have three broods (may require more or less than 7 days)
19. Endpoints	Survival and reproduction
20. Test acceptability	80% or greater survival and an average of 15 or more young/surviving females in the control solutions. At least 60% of surviving females in controls should have produced their third brood.
21. Sample volume required	1 Liter

^a Surface water test samples are used undiluted.

Table 2.7.4-1. Summary of Test Conditions for the 7-day Chronic Toxicity Test with *C. dubia*.

3 RESULTS

3.1 Results for the 14-day AGP Tests with *S. capricornutum*

The laboratory control produced an average maximum standing crop (MSC) of 103 mg/L. All of the samples produced similar MSC's ranging from 0 and 1 mg/L respectively. None of the samples tested demonstrated significant growth. Data for all samples are presented in Table 3.1-1.

Sample ID# (Laboratory)	Sample ID # (Client)	Maximum Standing Crop (mg/L)	Standard Deviation
Control	--	103	6
01006A	Cell 2	0	0
01006B	Cell 3	1	1
01006C	Cell 4	1	1
01006D	Cell 6	0	0
01006E	Cell 7	0	0

Table 3.1-1. Summary of the Results for the 14-day AGP Test with *S. capricornutum* initiated December 19, 2000.

3.2 Results for the 96-hour Chronic Toxicity Tests with *S. capricornutum*

The laboratory control produced an average growth of 5.53×10^5 cells/mL, which is well above the minimum growth of 2×10^5 cells/mL required by the method for a valid test. None of the samples demonstrated a significant reduction in growth. Data for all samples are presented in Table 3.2-1.

Sample ID# (Laboratory)	Sample ID # (Client)	Growth (cells/mL)
Control	--	5.53×10^5
01006A	Cell 2	1.50×10^6
01006B	Cell 3	1.23×10^6
01006C	Cell 4	1.24×10^6
01006D	Cell 6	8.60×10^5
01006E	Cell 7	1.30×10^6

Table 3.2-1. Summary of Results for the 96-hour Chronic Toxicity Test with *S. capricornutum* initiated December 19, 2000.

3.3 Results for the 7-day Chronic Toxicity Tests with *C. leedsi* & *C. dubia*.

The *C. dubia* control group had acceptable survival ($\geq 80\%$) and reproduction (>15 neonates, average, per surviving female). Samples Cell3, Cell4, & Cell7 effected reproduction to *C. dubia*.

The *C. leedsi* control group had acceptable survival ($>80\%$). There was significant reduction in survival to *C. leedsi* in client samples from Cell2, Cell4, Cell6, & Cell7. Likewise, there was a significant reduction in growth in client samples from Cell2, Cell4, Cell6, & Cell7.

Sample ID# (Laboratory)	Sample ID # (Client)	<i>Ceriodaphnia dubia</i>		<i>Cyprinella leedsi</i>	
		Survival (percent)	Reproduction (brood total)	Survival (percent)	Growth (mgs)
Control	--	100	26.7	87.5	0.21
01006A,F,K	Cell 2	90	23.6	32.5*	0.08*
Control	--	100	33.8	90.0	0.23
01006B,G,L	Cell 3	100	29.6*	80.0	0.19
01006C,H,M	Cell 4	100	30.1*	17.5*	0.02*
01006D,I,N	Cell 6	100	33.2	55*	0.11*
01006E,J,O	Cell 7	100	27.0*	35*	0.07*

An “*” denotes a significant difference between the sample and the control for the observed endpoint.

Table 3.3-1. Summary of Results of the 7-day Chronic Toxicity Test with *C. leedsi* & *C. dubia* initiated December 14 & 15, 2000.

4 REFERENCE TOXICANT TEST RESULTS

For the *S. capricornutum*, the reference toxicant test yielded an NOEC of 1.3g NaCl/L. This value is within the normal range of acceptable values. This indicates the test organisms were of acceptable sensitivity.

For the *C. dubia*, the reference toxicant test yielded an NOEC of 0.5g NaCl/L. This value is within the normal range of acceptable values. This indicates the test organisms were of acceptable sensitivity.

Given the short lead-time to prepare for this test, we did not conduct a reference toxicant test. We did however include our last reference test for the chronic *C. leedsi*.

Reference toxicant data is attached as Appendix B.

5 CONCLUSIONS

- Samples from five (5) sites were received in good condition at Hydrosphere Research on December 13, 15, & 18, 2000.
- The 14-day AGP tests with *S. capricornutum* did not demonstrate any significant growth due to the presence of nutrients in the sample.
- The 96-hour chronic toxicity tests with *S. capricornutum* were valid tests. None of the samples had an adverse effect.
- The 7-day chronic toxicity tests with *C. dubia* were valid tests. Client samples Cell3, Cell4, & Cell7 had an adverse effect to *C. dubia* reproduction.
- The 7-day chronic toxicity tests with *C. leedsi* were valid tests. Client samples Cell2, Cell4, Cell6, & Cell7 had an adverse effect to *C. leedsi* survival and growth

Appendix A

Raw Data Sheets



Algal Growth Test

Chronic: 96h Toxicity, 14d AGP, 14d NL

Client:	CH2M Hill-MWTS		Initiation Date:	12/1/00 TUE
Code:	CH2-EV	Job #:	01006	
Species:	<i>S. capricornutum</i>		Test Vessel:	250ml Erlenmeyer Flask
Control:	PAAP		Test Volume:	60mls per replicate

Sample	ID #	%	Rep	Pan (#)	Tare Weight (grams)	Total Weight (grams)	Filtered Vol. (mls)	MSC* (mg/L)	Standard Deviation
Control	0		A	1	1.3577	1.3612	15	100	5.77
			B	2	1.3583	1.3593	10	100	
			C	3	1.3775	1.3786	10	110	
A	100		A	4	1.3685	1.3685	50	Ø	Ø
			B	5	1.3807 ⁸ ①	1.3808	50	Ø	
			C	6	1.3974	1.3974	50	Ø	
B	100		A	7	1.3683	1.3683	50	Ø	1.15
			B	8	1.3609	1.3609	50	Ø	
			C	9	1.3805	1.3806	50	210-2	
C	100		A	10	1.3573	1.3573	50	Ø	1.15
			B	11	1.3723	1.3723	50	Ø	
			C	12	1.3934	1.3935	50	2	
D	100		A	13	1.3760	1.3760	50	Ø	Ø
			B	14	1.3726	1.3726	50	Ø	
			C	15	1.3875 ⁶ ①	1.3726	50	Ø	
E	100		A	16	1.3632 ²⁰	1.3632	50	Ø	Ø
			B	17	1.3815	1.3815	50	Ø	
			C	18	1.3479	1.3475	50	Ø	
			A						
			B						
			C						

Notes: ① correction from 12/01 TUE ② correction from 1/3/01 Wed.



Job #: CH2-EV 01006

Date: 11/20/01 TME
Pm

11/14 AGP

- 1) Rinsed GN-4 0.8 μm Metrcel Membrane Filters w/ ~300mls of Milli-Q Water. Pm 12:24
- 2) Placed in drying oven @ 65°C. Pm 12:54.
- 3) Removed Pens w/ filters from oven (now @ 68°C) & placed in dessicator Pm, 14:04.
- 4) Tared pens @ 14:02 Pm
- 5) Began filtering samples @ 14:15 Pm
- 6) Transferred filters w/ sample in pens to drying oven #1 @ 70°C. Pm 14:40.

11/15 Wed.

- 1) Transferred pens from drying oven @ 70°C to dessicator Pm 08:30.

96hr Green Alga Growth Test

Chronic: 96 hr

(EPA Method 1003.0)

Client:	CH2M Hill, MWTS	
Code:	CH2-EV	Job: <i>0006-00106</i>
Species:	<i>S. capricornutum</i>	Code: SC
Control:	PAAP ①	ID #: 00116
Initiation Date:	12/17/00 TUE	
Termination Date:	12/23/00 SAT	
Test Vessel:	250 ml Erlynmeyer Flask	
Test Volume:	100 mls per replicate	

Sample ID	Replicate	Section Count @ 96 hours					Cells/ml
		I	II	III	IV	Average	
Control ①	A	48	42	37	40	41.8	4.18×10^5
	B	64	51	72	67	63.5	6.35×10^5
	C	71	51	60	60	60.5	6.05×10^5
A ①	A	143	130	119	124	129	1.29×10^6
	B	163	159	187	168	169.3	1.693×10^6
	C	167	154	153	137	152.8	1.528×10^6
B ①	A	111	133	127	126	124.3	1.24×10^6
	B	119	142	128	129	129.5	1.29×10^6
	C	99	107	130	123	114.8	1.15×10^6
C ①	A	136	125	117	112	122.5	1.23×10^6
	B	132	121	107	117	119.3	1.19×10^6
	C	135	139	130	118	130.5	1.31×10^6
D ①	A	101	96	98	104	99.8	9.98×10^5
	B	83	77	74	65	74.8	7.48×10^5
	C	94	76	82	82	83.5	8.35×10^5
E ①	A	138	142	132	148	140	1.40×10^6
	B	121	145	114	124	126	1.26×10^6
	C	130	118	127	123	124.5	1.25×10^6

Notes: ① NO EDTA added to PAAP or Effluents. *Prm*
 ② correction? *Prm*

Water Quality

Client:	CH2M Hill, MWTS		
Code:	CH2-EV	Job #:	01006
Species:	<i>Ceriodaphnia dubia</i>		
ID #:	01006-1		

SM

pH

Sample ID	%	0	1	2	3	4	5	6	7
Control	0	7.8	7.9	7.8	7.7	7.6	7.5	7.4	7.3
B, G,L	100	7.5	8.5	7.7	7.0	8.6	7.2	8.5	7.4
C, H,M	100	7.6	8.5	7.7	7.3	8.4	7.5	8.2	7.6
D, I,N	100	7.6	8.6	7.7	7.4	8.1	7.5	8.2	7.7
E, J,O	100	7.6	8.5	7.7	7.2	8.3	7.3	8.5	7.7

Meter ID:

Day:

NOTES & COMMENTS:

① ID # 1016 sm 12.14 R

② Samples B,C,D, E sm

③ Samples E, H, I, S, J.

④ Samples L, M, N, O sm

Initials:

Time:

Initiation Date:	12.14.00	R
Termination Date:	12/18/00	R
Sample Description:		

Sample Location: MWTS
Cells 2, 3, 4, 6 and 7

Chronic Method: 7-Day

Initiation Date: 12.14.00 R Termination Date: 12/18/00 R

Dissolved Oxygen (mg/L)									
Conductivity (µmho/cm)									
	0	1	2	3	4	5	6	7	
	300	300	300	300	300	300	300	300	300
	298	295	295	295	295	295	295	295	295
	1193	1224	1185	1154	1150	1197	1184	1204	1216
	1216	1261	1300	1295	1310	1226	1090	1126	1147
	1143	1090	1095	1115	1142	1083	1156	1160	1175

Water Quality

Client:	CH2M Hill, MWTS
Code:	CH2-EV
Job #:	01006
Species:	Ceriodaphnia dubia
ID #:	1017

Chronic Method: 7-1

Initiation Date:	12-15-00 F	Termination Date:	12-20-00 F
Sample Description:		Sample Location: MWTS Cells 2, 3, 4, 6 and 7	

Sample ID	%	pH							Dissolved Oxygen (mg/L)							Conductivity (µmho/cm)								
		0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6
Control	0	7.8	7.2	8.0	7.6	8.1	7.6	8.0	7.7	7.8	8.0	7.4	8.2	8.4	7.1	8.2	8.8	8.1	7.6	8.1	7.6	8.1	7.6	8.1
A	100	7.9	8.5	7.1	8.5	7.6	8.1	7.5	8.1	7.5	8.1	7.4	7.4	7.4	7.4	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
F	K	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2

NOTES & COMMENTS:

Day: 0 1 2 3 4 5 6 7
 Sample ID: A A F F K K
 Dilution ID: 569 523 573 573 573 573
 Initials: SMT RC
 Time: 120 1320 1322 1345 1230 1330 1350 1350

Client: CH2-EV
Job Number: 01006
Test Date: 12/14/2001
Species: *C. dubia*
End Point: brood total

mg / individual

Replicate	Control	B
A	35	36
B	35	30
C	32	25
D	28	34
E	33	28
F	36	27
G	38	31
H	32	33
I	32	26
J	37	26

F-Test Two-Sample for Variances

	<i>Control</i>	<i>B</i>
Mean	33.8	29.6
Variance	8.844444	14.4888889
Observations	10	10
df	9	9
F	0.610429	
P(F<=f) one-tail	0.236797	
F Critical one-tail	0.314575	

t-Test: Two-Sample Assuming Unequal Variances

	<i>Control</i>	<i>B</i>
Mean	33.8	29.6
Variance	8.844444	14.4888889
Observations	10	10
Hypothesized Mean Difference	0	
df	17	
t Stat	2.749545	
P(T<=t) one-tail	0.006841	
t Critical one-tail	1.739606	
P(T<=t) two-tail	0.013681	
t Critical two-tail	2.109819	
t Critical two-tail	2.776451	

Result: There is a significant difference between Control and B for the endpoint brood total

Client: CH2-EV
Job Number: 01006
Test Date: 12/14/2001
Species: *C. dubia*
End Point: brood total

mg / individual

Replicate	Control	C
A	35	29
B	35	28
C	32	33
D	28	28
E	33	32
F	36	31
G	38	31
H	32	30
I	32	30
J	37	29

F-Test Two-Sample for Variances

	<i>Control</i>	<i>C</i>
Mean	33.8	30.1
Variance	8.844444	2.76666667
Observations	10	10
df	9	9
F	3.196787	
P(F<=f) one-tail	0.049221	
F Critical one-tail	3.178897	

t-Test: Two-Sample Assuming Unequal Variances

	<i>Control</i>	<i>C</i>
Mean	33.8	30.1
Variance	8.844444	2.76666667
Observations	10	10
Hypothesized Mean Difference	0	
df	14	
t Stat	3.43372	
P(T<=t) one-tail	0.002017	
t Critical one-tail	1.761309	
P(T<=t) two-tail	0.004033	
t Critical two-tail	2.144789	

Result: There is a significant difference between Control and C for the endpoint brood total

Client: CH2-EV
Job Number: 01006
Test Date: 12/14/2001
Species: *C. dubia*
End Point: brood total

F-Test Two-Sample for Variances

mg / individual

Replicate	Control	E
A	35	24
B	35	27
C	32	29
D	28	26
E	33	26
F	36	27
G	38	28
H	32	23
I	32	32
J	37	28

	Control	E
Mean	33.8	27
Variance	8.844444	6.44444444
Observations	10	10
df	9	9
F	1.372414	
P(F<=f) one-tail	0.32242	
F Critical one-tail	3.178897	

t-Test: Two-Sample Assuming Equal Variances

	Control	E
Mean	33.8	27
Variance	8.844444	6.44444444
Observations	10	10
Pooled Variance	7.644444	
Hypothesized Mean Difference	0	
df	18	
t Stat	5.499471	
P(T<=t) one-tail	1.6E-05	
t Critical one-tail	1.734063	
P(T<=t) two-tail	3.19E-05	
t Critical two-tail	2.100924	

Result: There is a significant difference between Control and E for the endpoint brood total



HYDROSPHERE

Client: CH2M Hill, MWTS **Code:** CH2-EV **Job:** 00000

Sample Data

Comments:



HYDROSPHERE

Client: CH2M Hill, MWTS **Job:** O1000e
Code: CH2-EV

Sample Data

25

Comments: ① correction from 12/17/00



HYDROSPHERE
research

Client:	CH2M Hill, MWTS
Code:	CH2-EV
Job:	01006

Sample Data

Sample Info				Dissolved Oxygen(D.O.)			Total Residual Chlorine			Ammonia			Conductivity			Salinity			Adjusted (ppm)			Initials		
#	Date	Day	Code	D.O.	D.O.	(mg/L)	D.O.	D.O.	(mg/L)	T.NH ₃	pH	(mg/L)	Conductivity	Conductivity	(μ mho/cm)	Initials	Salinity	(ppm)	Initials	Hardness	(mgCaCO ₃ /L)	Alkalinity	(mgCaCO ₃ /L)	
1	12.14	R	B	8.2	x	x	x	x	x	SM									325	300	300	300		
2			C	8.2	x	x	x	x	x	SM									360	360	360	360		
3			D	8.5	x	x	x	x	x	SM									375	325	325	325		
4			E	6.9	81.1	x	x	x	x	SM									360	325	325	325		
5	12.15	F	A	7.4	x	x	x	x	x	SM									325	325	325	325		
6			B	8.1	y	y	y	y	y										340	340	340	340		
7			C	7.7	x	x	x	x	x										365	365	365	365		
8			D	8.1	y	y	y	y	y										340	340	340	340		
9			E	7.1	y	y	y	y	y										365	365	365	365		
10	12.16		A																					
11			G																					
12			H																					
13			I																					
14			J																					
15																								
16																								

26

Comments: ① correction : 300 ; 350 . Run 12/10,

Dilution Waters			Initials		
Code	ID #		Hardness/Alkalinity	Hardness	Alkalinity
MHR	576		300	300	300
AMHR	569		340	340	340
AMH2O	573		365	365	365

Survival & Growth

Client:	CH2M Hill, MWTS		
Code:	CH2-EV		
Job #:	01006		
Species:	<i>Cyprinella leedsi</i>		
Code:	CL		
ID #:	1015		
Age:	< 72 hr		

Control Water:	MHR
ID #:	see "water quality"
Test Vessel:	1L glass chamber
Test Volume:	250mls / replicate

Live Counts

Sample ID	R	F	S	M	T	W	R	F
P	0	-	2	3	4	5	6	7
A	10	10	9	9	9	9	9	9
B	10	10	8	8	8	8	8	8
C	10	10	10	10	10	10	10	10
D	10	10	9	8	8	8	8	8
A	10	10	4	2	2	2	2	2
B	10	10	5	4	3	3	3	3
C	10	10	7	5	3	3	2	2
D	10	10	8	3	1	1	1	1

Initials	SM							
Time	1440	1405	1650	1420	1421	1500	1640	1740
Temperature	24.5	24.5	24.5	24.0	24.0	24.0	24.0	24.0
✓ for NUO	✓	✓	✓	✓	✓	✓	✓	✓

Feeding Type:

3x/day

Amount:	Time: 1	Time: 2	Time: 3
—	1200	—	1000
1800	1500	1447	1720
1500	1700	1700	1700

Artemia

Date Final Dry Weights:	12/23/00
NOTES & COMMENTS:	
① correction, 3/24/2001	

Note 1: NUO=No unusual observations

Survival & Growth

Client:	CH2M Hill, MWTS		
Code:	CH2-EV	Job #:	01006
Species:	<i>Cyprinella lectea</i>	Code:	CL
ID #:	1015	Age:	< 48 hr

Control Water:	MHR
ID #:	see "water quality"
Test Vessel:	1L glass chamber
Test Volume:	250mls / replicate

Live Counts

Sample ID	%	R	E	S	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	R
Control	0	0	9 ¹	8 ¹	8 ¹						
B, C, L	100	A	10	10	10	10	10	10	10	10	10
D, H, N	100	B	10	10	10	10	10	10	10	10	10
I, M	100	C	10	10	10	10	10	10	10	10	10
J, O	100	D	10	10	10	10	10	10	10	10	10
28		A	10	10	7 ³	7 ³	3 ⁴	3 ⁴	3 ⁴	3 ⁴	7
		B	10	10	9 ¹	7 ²	8 ²	8 ²	8 ²	8 ²	7
		C	10	10	9 ¹	9 ¹	8				
		D	10	10	10	10	9 ¹	9 ¹	9 ¹	9 ¹	9
		A	10	10	10	10	10	10	10	10	10
		B	10	10	10	10	10	10	10	10	10
		C	10	10	10	10	10	10	10	10	10
		D	10	10	10	10	10	10	10	10	10

Initials	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	S ₁₁
Time	1540	1300	1400	1640	H10	1416	1450	1600			
Temperature	25.5	25.5	24.5	24.5	24.0	24.0	24.0	24.0			
✓ for NUO	✓	✓	✓	✓	①	①	①	①	✓		

Feeding Type:	Artemia										
Amount:	3x/day										
Time: 1	1000	1200	-	1000	1100	1000	1000	1000			
Time: 2	1500	1500	1447	1240	1432	1502					
Time: 3	1800		1700	1700	1700						

Note 1: NUO=No unusual observations

Growth (Final dry weight basis)												
Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #	Pan #
1	0.9185	0.9203	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
2	0.9210	0.9231	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
3	0.9202	0.9225	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023	0.0023
4	0.9207	0.9228	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
5	0.9173	0.9211	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019	0.0019
6	0.9285	0.9302	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
7	0.9210	0.9311	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021
8	0.9285	0.9305	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
9	0.9278	0.9282	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
10	0.9267	0.9269	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
11	0.9124	0.9243	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
12	0.9244	0.9247	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
13	0.9223	0.9235	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
14	0.9247	0.9260	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
15	0.9247	0.9293	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
16	0.9130	0.9321	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014	0.0014
17	0.9281	0.9263	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
18	0.9283	0.9263	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
19	0.9283	0.9283	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
20	0.9254	0.9272	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018

Date Final Dry Weight:

Initials: Sef

NOTES & COMMENTS:
 ① Many of the mortality is in decay. Sun 12.17.00 Sun 12.21.00
 ② Correction. Sun 12.21.00

Water Quality

Client:	CH2M Hill, MWTS	
Code:	CH2-EV	Job #:
Species:	<i>Cyprinella leedsi</i>	
ID #:	1015	
Date:	01006	

卷之三

Sample Location: MWTS
Cells 2, 3, 4, 6 and 7

Initiation Date:	12.15.00 F	Termination Date:	12.22.00 T/T
		Chronic Method:	7-D
Sample Description: _____			
Sample Location: MWTS Cells 2, 3, 4, 6 and 7			

Sample ID	Control	A	100	%	Hd	
				0	7.8	7.9.7.8.17.11
				0	8.5	8.5.7.6.8.5.7.6
				0	8.0	8.0.7.8.8.0.7.8
				0	7.6	7.6.8.5.7.6.8.5.7.6
				0	7.5	7.5.8.5.7.6.8.5.7.6
				0	7.4	7.4.8.0.7.8.8.0.7.8
				0	7.3	7.3.8.0.7.8.8.0.7.8
				0	7.2	7.2.8.0.7.8.8.0.7.8
				0	7.1	7.1.8.0.7.8.8.0.7.8
				0	7.0	7.0.8.0.7.8.8.0.7.8
				0	6.9	6.9.8.0.7.8.8.0.7.8
				0	6.8	6.8.8.0.7.8.8.0.7.8
				0	6.7	6.7.8.0.7.8.8.0.7.8
				0	6.6	6.6.8.0.7.8.8.0.7.8
				0	6.5	6.5.8.0.7.8.8.0.7.8
				0	6.4	6.4.8.0.7.8.8.0.7.8
				0	6.3	6.3.8.0.7.8.8.0.7.8
				0	6.2	6.2.8.0.7.8.8.0.7.8
				0	6.1	6.1.8.0.7.8.8.0.7.8
				0	6.0	6.0.8.0.7.8.8.0.7.8
				0	5.9	5.9.8.0.7.8.8.0.7.8
				0	5.8	5.8.8.0.7.8.8.0.7.8
				0	5.7	5.7.8.0.7.8.8.0.7.8
				0	5.6	5.6.8.0.7.8.8.0.7.8
				0	5.5	5.5.8.0.7.8.8.0.7.8
				0	5.4	5.4.8.0.7.8.8.0.7.8
				0	5.3	5.3.8.0.7.8.8.0.7.8
				0	5.2	5.2.8.0.7.8.8.0.7.8
				0	5.1	5.1.8.0.7.8.8.0.7.8
				0	5.0	5.0.8.0.7.8.8.0.7.8
				0	4.9	4.9.8.0.7.8.8.0.7.8
				0	4.8	4.8.8.0.7.8.8.0.7.8
				0	4.7	4.7.8.0.7.8.8.0.7.8
				0	4.6	4.6.8.0.7.8.8.0.7.8
				0	4.5	4.5.8.0.7.8.8.0.7.8
				0	4.4	4.4.8.0.7.8.8.0.7.8
				0	4.3	4.3.8.0.7.8.8.0.7.8
				0	4.2	4.2.8.0.7.8.8.0.7.8
				0	4.1	4.1.8.0.7.8.8.0.7.8
				0	4.0	4.0.8.0.7.8.8.0.7.8
				0	3.9	3.9.8.0.7.8.8.0.7.8
				0	3.8	3.8.8.0.7.8.8.0.7.8
				0	3.7	3.7.8.0.7.8.8.0.7.8
				0	3.6	3.6.8.0.7.8.8.0.7.8
				0	3.5	3.5.8.0.7.8.8.0.7.8
				0	3.4	3.4.8.0.7.8.8.0.7.8
				0	3.3	3.3.8.0.7.8.8.0.7.8
				0	3.2	3.2.8.0.7.8.8.0.7.8
				0	3.1	3.1.8.0.7.8.8.0.7.8
				0	3.0	3.0.8.0.7.8.8.0.7.8
				0	2.9	2.9.8.0.7.8.8.0.7.8
				0	2.8	2.8.8.0.7.8.8.0.7.8
				0	2.7	2.7.8.0.7.8.8.0.7.8
				0	2.6	2.6.8.0.7.8.8.0.7.8
				0	2.5	2.5.8.0.7.8.8.0.7.8
				0	2.4	2.4.8.0.7.8.8.0.7.8
				0	2.3	2.3.8.0.7.8.8.0.7.8
				0	2.2	2.2.8.0.7.8.8.0.7.8
				0	2.1	2.1.8.0.7.8.8.0.7.8
				0	2.0	2.0.8.0.7.8.8.0.7.8
				0	1.9	1.9.8.0.7.8.8.0.7.8
				0	1.8	1.8.8.0.7.8.8.0.7.8
				0	1.7	1.7.8.0.7.8.8.0.7.8
				0	1.6	1.6.8.0.7.8.8.0.7.8
				0	1.5	1.5.8.0.7.8.8.0.7.8
				0	1.4	1.4.8.0.7.8.8.0.7.8
				0	1.3	1.3.8.0.7.8.8.0.7.8
				0	1.2	1.2.8.0.7.8.8.0.7.8
				0	1.1	1.1.8.0.7.8.8.0.7.8
				0	1.0	1.0.8.0.7.8.8.0.7.8
				0	0.9	0.9.8.0.7.8.8.0.7.8
				0	0.8	0.8.8.0.7.8.8.0.7.8
				0	0.7	0.7.8.0.7.8.8.0.7.8
				0	0.6	0.6.8.0.7.8.8.0.7.8
				0	0.5	0.5.8.0.7.8.8.0.7.8
				0	0.4	0.4.8.0.7.8.8.0.7.8
				0	0.3	0.3.8.0.7.8.8.0.7.8
				0	0.2	0.2.8.0.7.8.8.0.7.8
				0	0.1	0.1.8.0.7.8.8.0.7.8
				0	0.0	0.0.8.0.7.8.8.0.7.8

Meter ID:	3	3	3	3	3	3	3	3	3	3	3
Day:	0	1	2	3	4	5	6	7			
Sample ID:	A	A	F	F	F	K	K	K			
Dilution ID:	570	570	570	570	570	570	570	570			
Initials:	SM										
Time:	11:51	13:20	13:21	13:45	12:41	12:30	13:10	12:00			

NOTES & COMMENTS:

Disk: PRM#2.File:7CSR_CLW

Water Quality

Client:	CH2M Hill, MWTS
Code:	CH2-EV
Job #:	01006
Species:	Cyprinella lectea
ID #:	1015

Chronic Method: <input checked="" type="checkbox"/> 7-Day
Initiation Date: 12.14.00 R
Termination Date: 12.21.00 R
Sample Description: Sample Location: MWTS Cells 2, 3, 4, 6 and 7

Sample ID	%	pH							Dissolved Oxygen (mg/L)							Conductivity (µmho/cm)									
		0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
Control	0	7.8	8.0	7.8	7.4	8.0	7.7	7.8	7.7	8.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	301	301	300	300	305	316	296	310
G, L	100	7.5	8.3	7.8	8.5	7.0	8.7	7.2	8.4	7.3	8.5	7.3	8.5	7.4	8.5	7.5	7.5	1185	1180	1154	1197	1184	1224	1193	1216
H, M	100	7.6	8.3	7.7	8.5	6.3	8.3	6.4	8.0	6.5	8.1	6.5	8.1	6.7	8.2	6.7	6.7	1300	1295	1310	1226	1204	1261	1147	1140
D, I, N	100	7.6	8.3	7.7	8.1	7.4	8.7	7.2	8.4	7.1	8.4	7.4	8.4	7.4	8.5	7.5	7.5	1095	1090	1126	1147	1160	1090	1143	1147
E, J, P	100	7.6	8.4	7.7	8.5	7.2	8.5	7.3	8.4	7.7	8.2	7.3	8.3	7.4	8.4	7.4	7.4	1083	1080	1115	1142	1090	1095	1143	1147

Meter ID:

Day: 0 1 2 3 4 5 6 7

NOTES & COMMENTS:

- ① Samples B, C, D, E ② Samples G, H, I, J
 ③ Samples L, M, N, O

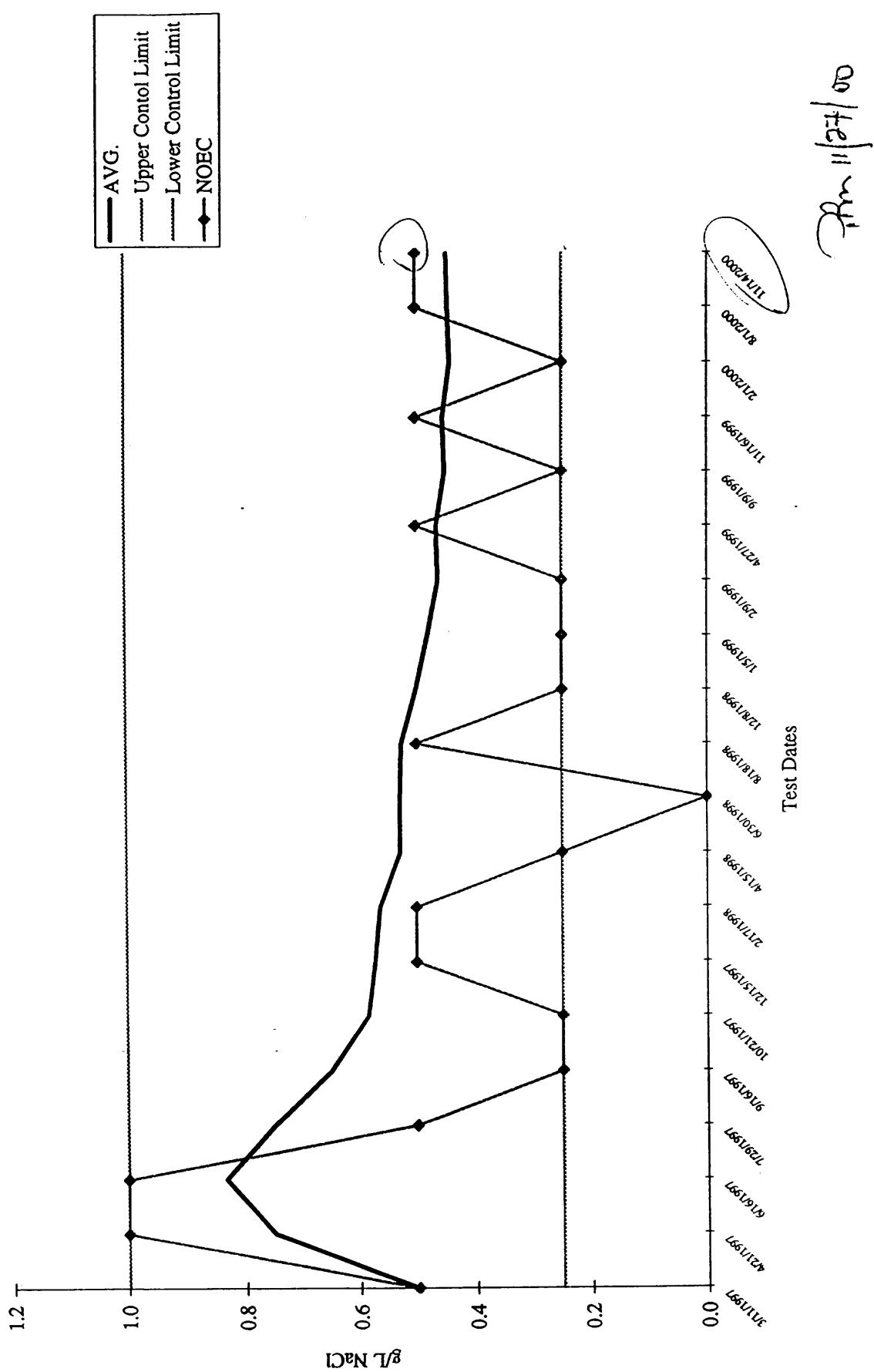
Initials:

Time:

Appendix B

Reference Toxicant Data

Control Chart for *Ceriodaphnia dubia* Chronic Standard Reference Toxicant Tests



SRT: Survival & Reproduction

SRT for the month of: **NOVEMBER**

Concurrent SRT for Job: _____

Initiation Date: **11/14/00** Termination Date: **11/21/00**

Control Water: **AMHR**

Toxicant: **NaCl**

ID #: **acc "water quality"**

Stock Solution (Concentration): **100g NaCl / liter**

Test Concentration (Units): **g NaCl / liter**

Test Vessel: **30 ml plastic Cup**

Test Volume: **20 ml / replicate**

Species: **C. dubia** Code: **Cd**

ID #: **1001** Age: **< 24**

Live Counts

1st dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **347**

2nd dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

3rd dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

4th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

5th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

6th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

7th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

8th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

9th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

10th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	
A	/	/	/	/	/	/	/	
B	/	/	/	/	/	/	/	
C	/	/	/	/	/	/	/	
D	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	
F	/	/	/	/	/	/	/	
G	/	/	/	/	/	/	/	
H	/	/	/	/	/	/	/	
I	/	/	/	/	/	/	/	
J	/	/	/	/	/	/	/	

Total Live Count: **10**

11th dilution

R E P

	W	R	F	S	S	M	T	P
P	1	2	3	4	5	6	7	

<tbl_r cells="9" ix="4" maxcspan="1" maxrspan="1" usedcols="9

TITLE: November-SRT; 7CSRD; CD Reproduction
FILE: a:novcd.txt
TRANSFORM: NO TRANSFORMATION

NUMBER OF GROUPS: 4

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Control	1	35.0000	✓ 35.0000
1	Control	2	36.0000	✓ 36.0000
1	Control	3	34.0000	✓ 34.0000
1	Control	4	36.0000	✓ 36.0000
1	Control	5	35.0000	✓ 35.0000
1	Control	6	35.0000	✓ 35.0000
1	Control	7	33.0000	✓ 33.0000
1	Control	8	37.0000	✓ 37.0000
1	Control	9	31.0000	✓ 31.0000
1	Control	10	32.0000	✓ 32.0000
2	0.25	1	35.0000	, 35.0000
2	0.25	2	34.0000	✓ 34.0000
2	0.25	3	40.0000	✓ 40.0000
2	0.25	4	32.0000	, 32.0000
2	0.25	5	38.0000	✓ 38.0000
2	0.25	6	37.0000	✓ 37.0000
2	0.25	7	31.0000	✓ 31.0000
2	0.25	8	35.0000	✓ 35.0000
2	0.25	9	28.0000	✓ 28.0000
2	0.25	10	37.0000	✓ 37.0000
3	0.5	1	34.0000	, 34.0000
3	0.5	2	35.0000	✓ 35.0000
3	0.5	3	29.0000	✓ 29.0000
3	0.5	4	34.0000	✓ 34.0000
3	0.5	5	34.0000	✓ 34.0000
3	0.5	6	29.0000	✓ 29.0000
3	0.5	7	33.0000	✓ 33.0000
3	0.5	8	33.0000	✓ 33.0000
3	0.5	9	34.0000	✓ 34.0000
3	0.5	10	34.0000	✓ 34.0000
4	1	1	34.0000	- 34.0000
4	1	2	34.0000	✓ 34.0000
4	1	3	33.0000	✓ 33.0000
4	1	4	32.0000	✓ 32.0000
4	1	5	2.0000	✓ 2.0000
4	1	6	28.0000	✓ 28.0000
4	1	7	3.0000	✓ 3.0000
4	1	8	30.0000	✓ 30.0000
4	1	9	26.0000	✓ 26.0000
4	1	10	27.0000	✓ 27.0000

John 11/27/00

November SRT; 7CSRD; CD Reproduction
File: a:novcd.txt Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.680	9.680	15.280	9.680	2.680
OBSERVED	6	4	13	17	0

Calculated Chi-Square goodness of fit test statistic = 16.0013
Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

November SRT; 7CSRD; CD Reproduction
File: a:novcd.txt Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 1516.300

W = 0.760

Critical W (P = 0.05) (n = 40) = 0.940
Critical W (P = 0.01) (n = 40) = 0.919

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

November SRT; 7CSRD; CD Reproduction
File: a:novcd.txt Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 39.71
Table Chi-square value = 11.34 (alpha = 0.01)
Table Chi-square value = 7.81 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 9.00
Used for Chi-square table value ==> df (#groups-1) = 3

Data FAIL homogeneity test at 0.01 level. Try another transformation.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

7/27/06

November SRT; 7CSRD; CD Reproduction
File: a:novcd.txt Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Control	10	31.000	37.000	34.400
2	0.25	10	28.000	40.000	34.700
3	0.5	10	29.000	35.000	32.900
4	1	10	2.000	34.000	24.900

November SRT; 7CSRD; CD Reproduction
File: a:novcd.txt Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM
1	Control	3.600	1.897	0.600
2	0.25	12.900	3.592	1.136
3	0.5	4.544	2.132	0.674
4	1	147.433	12.142	3.840

November SRT; 7CSRD; CD Reproduction
File: a:novcd.txt Transform: NO TRANSFORMATION

STEELS MANY-ONE RANK TEST

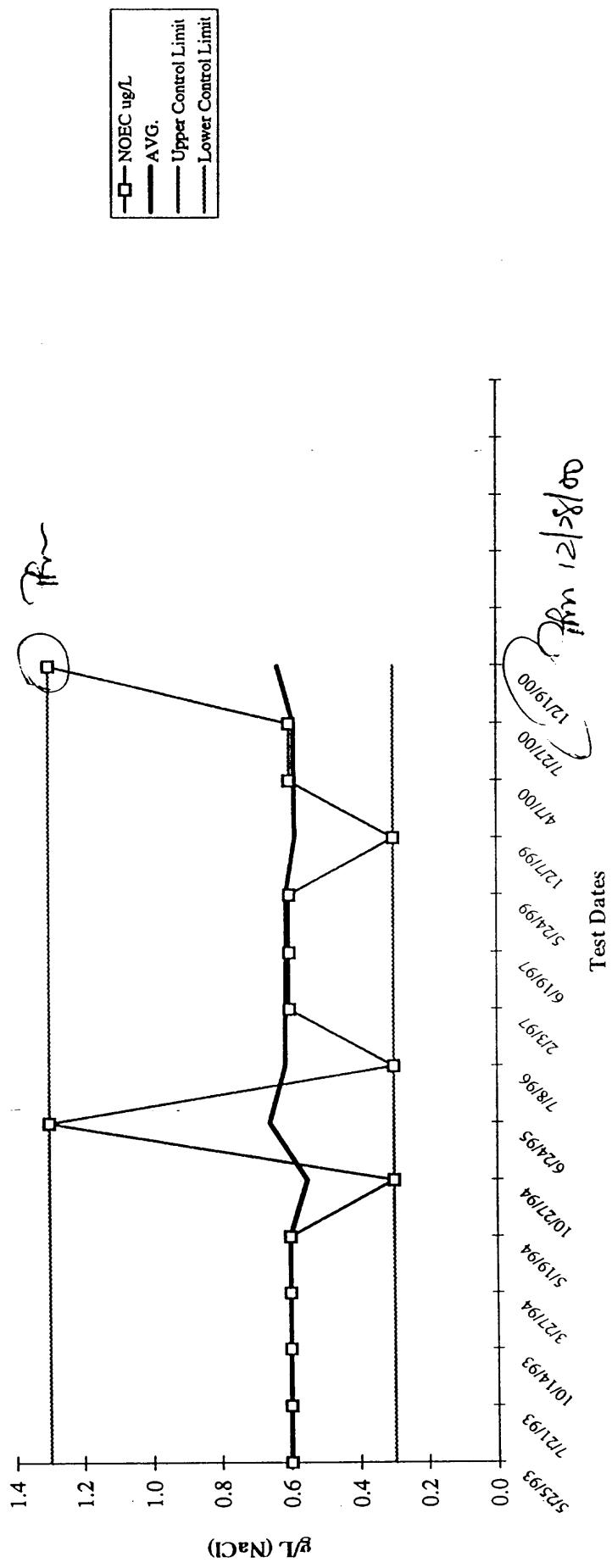
H₀: Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED		RANK SUM	CRIT. VALUE	df	SIG
		MEAN	SUM				
1	Control	34.400					
2	0.25	34.700	110.50	77.00	10.00		
3	NOTC → 0.5	32.900	83.00	77.00	10.00		
4	1	24.900	66.00	77.00	10.00	*	

Critical values use k = 3, are 1 tailed, and alpha = 0.05

Phm 11/27/00

Control Chart for *Selenastrum capricornutum*
Chronic Standard Reference Toxicant Tests



SRT: 96hr Alga Growth Test

Chronic: 96 hr

(EPA Method 1003.0)

SRT for the Month of:
DECEMBER

Initiation Date: **12/19/00 TUE**
Termination Date: **12/23/00 SAT**

Species: **S. capricornutum** Code: **SC**
Control: **PAAP (1)** ID #: **00115**

Test Vessel: **250 ml Erlenmeyer Flask**
Test Volume: **100 mls per replicate**

NaCl (g/L)	Replicate	Section Count @ 96 hours				Cells/ml
		I	II	III	IV	
Control	A	47	43	45	43	44.5 4.45×10^5
	B	55	48	66	70	59.8 5.98×10^5
	C	46	43	44	49	45.5 4.55×10^5
0.3	A	30	43	46	37	39.0 3.90×10^5
	B	57	58	53	52	55.8 5.58×10^5
	C	60	61	55	65	60.3 6.03×10^5
0.6	A	37	42	39	45	40.8 4.08×10^5
	B	38	38	37	36	37.5 3.75×10^5
	C	43	28	39	44	38.5 3.85×10^5
1.3	A	33	27	36	34	32.5 3.25×10^5
	B	41	44	45	44	43.5 4.35×10^5
	C	25	30	27	33	28.8 2.88×10^5
3	A	11	15	19	13	14.5 4.5×10^5
	B	14	13	15	13	13.8 1.38×10^5
	C	18	15	15	22	17.5 1.75×10^5
6	A	2	3	2	1	2.0×10^4
	B	1	1	1	1	1.0×10^4
	C	2	3	2	1	2.0×10^4

Notes: (1) PAAP w/ EDTA Run 12/19/00 TUE

SRT; NaCl; 96csrd; S. capricornutum; growth
File: C:\temp\001219ag Transform: LOG BASE 10(Y)

~~spiro~~ Wilks test for normality

D = 0.115

W = 0.933

Critical W (P = 0.05) (n = 18) = 0.897

Critical W (P = 0.01) (n = 18) = 0.858

Data ~~PASS~~ normality test at P=0.01 level. Continue analysis.

12/28/00

SRT; NaCl; 96csrd; S. capricornutum; growth
File: C:\temp\001219ag Transform: LOG BASE 10(Y)

~~F~~ : letts test for homogeneity of variance

Calculated B statistic = 6.70
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 2.00
Used for Chi-square table value ==> df (#groups-1) = 5

Data ~~PASS~~ homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

7/28/00

TITLE: SRT; NaCl; 96csrd; *S. capricornutum*; growth
 FILE: C:\temp\001219ag
 TRANSFORM: LOG BASE 10(Y) NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Control	1	445000.0000	5.6484
1	Control	2	598000.0000	5.7767
1	Control	3	455000.0000	5.6580
2	0.3	1	390000.0000	5.5911
2	0.3	2	558000.0000	5.7466
2	0.3	3	603000.0000	5.7803
3	0.6	1	408000.0000	5.6107
3	0.6	2	375000.0000	5.5740
3	0.6	3	385000.0000	5.5855
4	1.3	1	325000.0000	5.5119
4	1.3	2	435000.0000	5.6385
4	1.3	3	288000.0000	5.4594
5	3	1	145000.0000	5.1614
5	3	2	138000.0000	5.1399
5	3	3	175000.0000	5.2430
6	6	1	20000.0000	4.3010
6	6	2	10000.0000	4.0000
6	6	3	20000.0000	4.3010

12/28/00

SRT; NaCl; 96csrd; S. capricornutum; growth
File: C:\temp\001219ag Transform: LOG BASE 10(Y)

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Control	3	5.648	5.777	5.694
2	0.3	3	5.591	5.780	5.706
3	0.6	3	5.574	5.611	5.590
4	1.3	3	5.459	5.638	5.537
5		3	5.140	5.243	5.181
6		6	4.000	4.301	4.201

SRT; NaCl; 96csrd; S. capricornutum; growth
File: C:\temp\001219ag Transform: LOG BASE 10(Y)

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM
1	Control	0.005	0.071	0.041
2	0.3	0.010	0.101	0.058
3	0.6	0.000	0.019	0.011
4	1.3	0.008	0.092	0.053
5		0.003	0.054	0.031
6		0.030	0.174	0.100

PM 12/28/00

SRT; NaCl; 96csrd; S. capricornutum; growth
File: C:\temp\001219ag Transform: LOG BASE 10(Y)

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	5.043	1.009	100.900
Within (Error)	12	0.115	0.010	
Total	17	5.158		

Critical F value = 3.11 (0.05, 5, 12)

Since F > Critical F REJECT H_0 : All groups equal

3/12/80

SRT; NaCl; 96csrd; S. capricornutum; growth
 File: C:\temp\001219ag Transform: LOG BASE 10(Y)

DUNNETTS TEST

TABLE 1 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	Control	5.694	499333.333		
2	0.3	5.706	517000.000	-0.143	
3	0.6	5.590	389333.333	1.277	
4	NOEC = 1.3	5.537	349333.333	1.932	
5	3	5.181	152666.667	6.282	*
6	6	4.201	16666.667	18.294	*

Dunnett table value = 2.50 (1 Tailed Value, P=0.05, df=12,5)

SRT; NaCl; 96csrd; S. capricornutum; growth
 File: C:\temp\001219ag Transform: LOG BASE 10(Y)

DUNNETTS TEST

TABLE 2 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	Control	3			
	0.3	3	185522.130	37.2	-17666.667
	0.6	3	185522.130	37.2	110000.000
4	1.3	3	185522.130	37.2	150000.000
5	3	3	185522.130	37.2	346666.667
6	6	3	185522.130	37.2	482666.667

12/28/00

SRT: Water Quality

SRT for the month of:

PCE-112-2

HSA99105

Species: *Cyprinella lutae*

ID #: **847**

<input checked="" type="checkbox"/> concurrent SRT for Job:	
PCE-112-2	
HSA99105	

CHRONIC:

Initiation Date: **12/30/992**

Toxicant: **NaCl**

100g NaCl / liter

Stock Solution (Concentration):
Test Concentration (Units):
g NaCl / liter

mls of
stock /
1000mls

pH

Dissolved Oxygen (mg/L)

Conductivity ($\mu\text{mho/cm}$)

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6 7

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SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

5 piro Wilks test for normality

D = 0.444

W = 0.959

Critical W (P = 0.05) (n = 20) = 0.905

Critical W (P = 0.01) (n = 20) = 0.868

Data PASS normality test at P=0.01 level. Continue analysis.

SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

F tletts test for homogeneity of variance

Calculated B statistic = 3.11
Table Chi-square value = 13.28 (alpha = 0.01)
Table Chi-square value = 9.49 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 3.00
Used for Chi-square table value ==> df (#groups-1) = 4

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

LE: SRT; 991230ns; 7csrd; cl survival

FILE: A:991230ns

TRANSFORM: ARC SINE(SQUARE ROOT(Y))

NUMBER OF GROUPS: 5

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Control	1	0.7000	0.9912
1	Control	2	0.6000	0.8861
1	Control	3	0.9000	1.2490
1	Control	4	1.0000	1.4120
2	0.5	1	0.7000	0.9912
2	0.5	2	0.6000	0.8861
2	0.5	3	0.5000	0.7854
2	0.5	4	0.7000	0.9912
3	1	1	0.3000	0.5796
3	1	2	0.5000	0.7854
3	1	3	0.7000	0.9912
3	1	4	0.3000	0.5796
4	2	1	0.6000	0.8861
4	2	2	0.4000	0.6847
4	2	3	0.4000	0.6847
4	2	4	0.4000	0.6847
5	4	1	0.4000	0.6847
5	4	2	0.1000	0.3218
-	4	3	0.2000	0.4636
4	4		0.4000	0.6847

SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Control	4	0.886	1.412	1.135
2	0.5	4	0.785	0.991	0.913
3	1	4	0.580	0.991	0.734
4	2	4	0.685	0.886	0.735
5		4	0.322	0.685	0.539

SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM
1	Control	0.057	0.240	0.120
2	0.5	0.010	0.099	0.049
3	1	0.039	0.197	0.098
	2	0.010	0.101	0.050
	4	0.032	0.178	0.089

SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	4	0.804	0.201	6.700
Within (Error)	15	0.444	0.030	
Total	19	1.248		

Critical F value = 3.06 (0.05,4,15)
Since F > Critical F REJECT Ho:All groups equal

Inhibition Concentration
Calculation
(IC_x)

CH2M Hill
July 1991

Client:
Project Number: 991230ng
Test Solution: NaCl
Test Date: 991230
Test Organism: CL
Response Measured: growth

Concentration (g/L)	Mean Response	Smoothed Mean Response
Control	0.233	0.255
0.50	0.278	0.255
1.00	0.245	0.245
2.00	0.188	0.188
4.00	0.083	0.083

	IC25 (g/L)	Toxic Units
Linear Interpolation Estimate	1.93	0.52
Bootstrap estimate	1.72	0.58
Empirical lower 95% CL	0.85	1.18
Empirical upper 95% CL	2.42	0.41

Bootstrap standard deviation:	0.4633
Number of bootstrap iterations:	200
Number of bootstrap values greater than highest conc:	0

SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED		MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
		MEAN				
1	Control	1.135		0.800		
2	0.5	0.913		0.625	1.806	
3	1	0.734		0.450	3.271	*
4	2	0.735		0.450	3.262	*
5	4	0.539		0.275	4.865	*

Dunnett table value = 2.36 (1 Tailed Value, P=0.05, df=15, 4)

SRT; 991230ns; 7csrd; cl survival
File: A:991230ns Transform: ARC SINE(SQUARE ROOT(Y))

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum	Sig Diff	% of	DIFFERENCE
			(IN ORIG. UNITS)	CONTROL	FROM CONTROL	
1	Control	4				
2	0.5	4	0.261	32.7	0.175	
~	1	4	0.261	32.7	0.350	
	2	4	0.261	32.7	0.350	
5	4	4	0.261	32.7	0.525	

Appendix C

Chain of Custody



HYDROSPHERE
research

CHAIN OF CUSTODY

Grey areas are to be completed by lab personnel

Client Name CH2M HILL	Client Shipping Address 800 N. Railway Drive, Suite 350, Deerfield Beach, FL 33442		
Sample Kit Tracking Information Cooler 7 of 10 Container Type <input checked="" type="checkbox"/> ½ Gallon Jug <input checked="" type="checkbox"/> 5 Gallon Container <input type="checkbox"/> Other _____ # of Containers 8	Method Of Shipment <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Client Pickup <input type="checkbox"/> UPS <input type="checkbox"/> Airborne Express <input type="checkbox"/> Greyhound <input type="checkbox"/> RPS <input type="checkbox"/> Other _____	Prepared and Shipped By Craig Watts Date 12/13/99	Sample Kit Received By (Print Clearly and Sign) Date 12-13-00 Time 8:00 Condition of Seal Upon Receipt (Check One) <input type="checkbox"/> Intact <input type="checkbox"/> Other (describe) /A

Ship Sample To Hydrosphere Research 1901 NW 67th Place, Suite D Gainesville, FL 32653-1657 (352) 375-9004 Be sure to mark for Saturday delivery if appropriate.	Refrigerant Used for Shipping <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Other _____ Samples should arrive at the lab at 4.0°C or less but never frozen. Pack cooler completely with ice before shipping.	Composite Sample Information Samples/ Hour N/A Volume/Sample 20 Total Hours 8 Total Volume 200 Initiated Date 12/13 Time 0800 Ended Date 12/13 Time 1600 Chilled During Collection <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>after</i>
Sampling Location MWTS	Sample(s) Shipped Via <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Client <input type="checkbox"/> UPS <input type="checkbox"/> Other _____	
Permit #		
County Samples Collected In Palm Beach		

Outfall Number	Date	Time (24 Hour Format)	Sample Type		# of Containers	Sampled By (Print Clearly and Sign)	For Lab Use	
			Comp.	Grab			Arrival Temp (°C)	Sample Id No.
Cell 2	12/13/00	8-4	X		4	Sean Cimillucca	12.0	01006 A
Cell 3	12/13/00	8-4	X		4	Sean Cimillucca	11.0	01006 B
Cell 4	12/13/00	8-4	X		4	Sean Cimillucca	1.0	01006 C
Cell 6	12/13/00	8-4	X		4	Sean Cimillucca	1.0	01006 D
Cell 7	12/13/00	8-4	X		4	Sean Cimillucca	1.0	01006 E

① Received only 2 of 3 coolers on 12-14. All of Sample A, 1 container of Sample D, and 2 containers of Sample B have not arrived this date. 12/15/00 FPI@10:20. MKL/SH

Relinquished By (Print Clearly and Sign) <i>[Signature]</i>	Date 12/13/00	Time 5:00	Shipped Via FedEx		
Received By (Print Clearly and Sign) <i>SM 12-14 R</i>	Date	Time	Relinquished By (Print Clearly and Sign)	Date	Time
Received By Lab (Print Clearly and Sign) <i>Scott W. Morris</i>	Date 12-14-00	Time 1129	Shippers Tracking Numbers 818829400212		



HYDROSPHERE
research

CHAIN OF CUSTODY

Grey areas are to be completed by lab personnel

Client Name CR200111	Client Shipping Address 800 Fairway Drive, Suite 450, Deerfield Beach, FL 33441
Sample Kit Tracking Information	
Carrier Goodee Other	Method Of Shipment <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> Client Pickup <input type="checkbox"/> UPS <input type="checkbox"/> Airborne Express <input type="checkbox"/> Greyhound <input type="checkbox"/> RPS <input type="checkbox"/> Other
Container Type 1/2 Gallon Jug 5 Gallon Cubitalner Other	Prepared and Shipped By Craig Vallee
Net Containers	Date 12/13/99
Sample Kit Received By (Print Clearly and Sign)	
Date _____ Time _____	
Condition of Seal Upon Receipt (Check One) <input type="checkbox"/> Intact <input type="checkbox"/> Other (describe) _____	

Ship Sample To Hydrosphere Research 1901 NW 67th Place, Suite D Gainesville, FL 32653-1657 (352) 375-9004 Be sure to mark for Saturday delivery if appropriate.	Refrigerant Used for Shipping <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Other Samples should arrive at the lab at 4.0°C or less but never frozen. Pack cooler completely with ice before shipping.	Composite Sample Information Samples/ Hour 1 Volume/Sample _____ Total Hours 24 Total Volume 2 gal Initiated Date 12/14 Time 2:00 Ended Date 12/15 Time 2:00 Chilled During Collection <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sampling Location	Sample(s) Shipped Via <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> Client <input type="checkbox"/> UPS <input type="checkbox"/> Other	
Permit #	Greyhound <input type="checkbox"/> RPS <input type="checkbox"/> Airborne Express <input type="checkbox"/>	
County Samples Collected In <i>Palm Beach</i>		

Outfall Number	Date	Time (24 Hour Format)	Sample Type		# of Containers	Sampled By (Print Clearly and Sign)	For Lab Use	
			Comp.	Grab			Arrival Temp (°C)	Sample Id No.
cell 2	12/15/00	3 AM 3 PM	X		5	Sean Crimmins	55	0100CF
3	"	"	X		5	"		HG
4	"	"	X		5	"		TH
5	"	"	X		5	"		TJ
6	"	"	X		5	"	V	KP
								PM

Relinquished By (Print Clearly and Sign) <i>Call</i>	Date 12/15/00	Time 4:00	Shipped Via FedEx		
Received By (Print Clearly and Sign)	Date	Time	Relinquished By (Print Clearly and Sign)	Date 12/16/00	Time
Received By Lab (Print Clearly and Sign) <i>PETER MEYER P.M.</i>	Date 12/16/00	Time 11:30	Shipper's Tracking Numbers 812354170355		



HYDROSPHERE
research

CHAIN OF CUSTODY

Grey areas are to be completed by lab personnel

Client Name CH200111	Client Shipping Address 800 Fairway Drive, Suite 350 Deerfield Beach, FL 33441-8311		
Sample Kit Tracking Information Cooler _____ Container type: 1/2 Gallon Jug Other: _____ # of Containers: 5	Method Of Shipment <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> Client Pickup <input type="checkbox"/> UPS <input type="checkbox"/> Airborne Express <input type="checkbox"/> Greyhound <input type="checkbox"/> RPS <input checked="" type="checkbox"/> Other: Federal Express	Prepared and Shipped By Craig Watts Date 12/18/09	Sample Kit Received By (Print Clearly and Sign) Date _____ Time _____
Condition of Seal Upon Receipt (Check One) <input type="checkbox"/> Intact <input type="checkbox"/> Other (describe) _____			

Ship Sample To Hydrosphere Research 1901 NW 67th Place, Suite D Gainesville, FL 32653-1657 (352) 375-9004 Be sure to mark for Saturday delivery if appropriate.	Refrigerant Used for Shipping <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Other _____ Samples should arrive at the lab at 4.0°C or less but never frozen. Pack cooler completely with ice before shipping.	Composite Sample Information Samples/ Hour 1 Volume/Sample _____ Total Hours 24 Total Volume 2.9 Initiated Date 12/17 Time 2:00 Ended Date 12/18 Time 2:00 Chilled During Collection <input type="checkbox"/> Yes X No
Sampling Location	Sample(s) Shipped Via <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> Greyhound <input type="checkbox"/> Client <input type="checkbox"/> RPS <input type="checkbox"/> UPS <input type="checkbox"/> Airborne Express <input type="checkbox"/> Other _____	
Permit #		
County Samples Collected In		

Outfall Number	Date	Time (24 Hour Format)	Sample Type		# of Containers	Sampled By (Print Clearly and Sign)	For Lab Use	
			Comp.	Grab			Arrival Temp (°C)	Sample Id No.
cell 2	12-18-09		X		5	<i>Sean Carrigan</i>	0.5	01006 K
cell 3	"		X		5		0.5	01006 L
cell 4	"		X		5		0.5	01006 M
cell 5	"		X		5		0.5	01006 N
cell 6	"		X		5		0.5	01006 O

Relinquished By (Print Clearly and Sign) <i>SCOTT W. MOOTS</i>	Date 12/18/09	Time 4:00	Shipped Via FedEx
Received By (Print Clearly and Sign) <i>SCOTT W. MOOTS</i>	Date	Time	Relinquished By (Print Clearly and Sign) SM 12-19-09 T
Received By Lab (Print Clearly and Sign) <i>SCOTT W. MOOTS</i>	Date 12-19-09	Time 12:02	Shippers Tracking Numbers 818829400164 (FedEx)